

# Claims

- [c1] 1. A device, comprising:
- a resistor;
  - a heater disposed proximate to the resistor and capable of raising the temperature of the resistor;
  - a dielectric disposed between the heater and the resistor; and
  - a tuner electrically coupled to the resistor, wherein the heater adjusts the resistance of the resistor in response to the tuner.
- [c2] 2. The device of claim 1, further comprising:
- a heater driver circuit electrically coupled to the heater and to the tuner, wherein the heater driver circuit supplies a heating current to the heater.
- [c3] 3. The device of claim 2, wherein:
- the tuner transmits an output signal to the heater driver circuit when the temperature of the resistor is outside a nominal temperature range.
- [c4] 4. The device of claim 1, wherein:
- the resistor, the heater, and the tuner are disposed on a semiconductor wafer.

- [c5] 5. The device of claim 1, wherein:  
the resistor, the heater and the dielectric are at least partially disposed within a dielectric material.
- [c6] 6. The device of claim 5, wherein:  
the thermal conductivity of the dielectric is higher than that of the dielectric material.
- [c7] 7. The device of claim 5, wherein:  
the dielectric material substantially encases the resistor, the heater and the dielectric.
- [c8] 8. The device of claim 5, wherein the heater maintains the resistor at an elevated temperature while the resistor is in use.
- [c9] 9. The device of claim 5, further comprising:  
one or more conductors extending through the dielectric material and contacting the resistor, wherein the conductors couple the resistor to the tuner.
- [c10] 10. A semiconductor chip comprising the device recited in claim 1.
- [c11] 11. A method of operating a resistor, comprising:  
providing a resistor;  
providing a tuner that is electrically coupled to the resistor;

detecting a resistance of the resistor; and  
adjusting the temperature of the resistor when the  
resistance of the resistor is outside a nominal resistance range.

[c12] 12. The method of claim 11, further comprising:  
providing a heater capable of raising the temperature  
of the resistor; and  
providing a dielectric disposed between the heater  
and the resistor, wherein  
adjusting the temperature of the resistor comprises  
adjusting the temperature of the heater.

[c13] 13. The method of claim 12, further comprising:  
providing a dielectric material, wherein  
the resistor, the heater and the dielectric are at least  
partially disposed within the dielectric material, and  
wherein  
the thermal conductivity of the dielectric is higher  
than that of the dielectric material.

[c14] 14. The method of claim 11, adjusting the temperature  
of the resistor comprises:  
passing a DC current through the resistor.

[c15] 15. A method of making a device, comprising:  
providing a first dielectric material;

forming a heater over the first dielectric material;  
forming a dielectric over the heater;  
forming a resistor over the dielectric; and  
electrically coupling the resistor to a tuner, wherein  
the heater is arranged to adjust the resistance of  
the resistor in response to the tuner.

[c16] 16. The method of claim 15, further comprising:  
providing a heater driver circuit; and  
electrically coupling the heater driver circuit to the  
heater and to the tuner, wherein the heater driver  
circuit is arranged to supply a heating current to the  
heater.

[c17] 17. The method of claim 15, wherein:  
the resistor, the heater, and the tuner are formed on  
a semiconductor wafer.

[c18] 18. The method of claim 15, further comprising:  
at least partially encasing the resistor, the heater and  
the dielectric within a dielectric material.

[c19] 19. The method of claim 18, wherein:  
the thermal conductivity of the dielectric is higher  
than that of the dielectric material.

[c20] 20. The method of claim 15, further comprising:  
blowing one or more fuses so that a constant heating

current flows through the heater.